

REMARKS

At the outset, the Examiner is thanked for the thorough review and consideration of the subject application. The Office Action of June 30, 2004 has been received and contents carefully reviewed.

By this Amendment, Applicant amends the specification and claims 41 and 55. Accordingly, claims 41-56 are currently pending in the present application. Reexamination and reconsideration of the application are respectfully requested.

In the Office Action, the Examiner objected to the specification because of typographical errors. Applicant has amended the specification to cure minor typographical errors. No new matter is added to the specification. Accordingly, Applicant respectfully submits that in view of the amendments in the specification, this objection is now believed to be moot.

In addition, the Examiner rejected claims 41-56 under 35 U.S.C. § 103(a) as being unpatentable over Yamaguchi et al. (U.S. Patent No. 5,897,346) and in view of Aomori et al. (U.S. Patent No. 5,504,020). Applicant respectfully traverses these rejections.

Claim 41 is allowable over the cited references in that claim 41 recites a combination of elements including, for example, “forming an impurity region by implanting impurity ions to said excited region in a heavy dosage while the excited region remains in an excited state and has a temperature high enough to self-activate the impurity ions, whereby the implanted impurity ions become self-activated.” None of the cited references, singly or in combination, teaches or suggests at least this feature of the claimed invention. Accordingly, Applicant respectfully submits that claim 41 and claims 42-54, which depend therefrom, are allowable over the cited references.

In the Office Action on page 4, the Examiner cites Yamaguchi et al as teaching the limitation of “...forming an impurity region by heavily implanting impurity ions to said excited region in a heavy dosage while the excited region remains in an excited state, (Fig. 1C implanting P⁺ ions Yamaguchi col. 9 lines 14 and figs. 1C, etc. describe heavily implanting ions,).” Applicant respectfully disagrees.

Applicant respectfully submits that to establish a prima facie case of obviousness under 35 U.S.C. § 103, the prior art references when combined must at least teach or suggest all the

claim elements. In the present application, the hydrogen implantation heats up the active layer to form the “excited region”, and then the impurity ions are implanted into the “excited region” to form source and drain regions while the “excited region” remains in an excited state and has a temperature high enough to self-activate the impurity ions. See, for example, page 6, lines 20-24 of the present application. Accordingly, Applicant respectfully submits that as best understood, nowhere in Yamaguchi et al. teaches “forming an impurity region by implanting impurity ions to said excited region in a heavy dosage while the excited region remains in an excited state.” In order to further clarify the element of “excited region,” Applicant has hereby added to claims 41 and 55 a further limitation of “the excited region... has a temperature high enough to self-activate the impurity ions.”

In the Office Action on page 6, the Examiner states, “[w]ith respect to claim 51 Yamaguchi describes...said hydrogen ions are implanted to heat up the excited region to a temperature between about 200~300 degrees Celsius. (Yamaguchi col.9 line 15 and 54).” Applicant respectfully disagrees.

Yamaguchi et al. in col. 9, lines 15-54 discloses, “[a]nnealing for hydrogenation is performed at 200-500 °C for 1 hour in an atmosphere containing hydrogen under normal pressure ...[t]his annealing confines the introduced hydrogen ion in the active layer and reduces dangling bonds and defects in the active layer. (Fig. 2E)” Applicant respectfully submits that this hydrogenation process is a post annealing process to reduce defects in the active layer, and thus this is a separate process different from the hydrogen implantation process.

Claim 55 is allowable over the cited references in that claim 55 recites a combination of elements including, for example, “forming an impurity region by implanting impurity ions to said excited region while the excited region remains in an excited state and has a temperature high enough to self-activate the impurity ions, wherein the activation of said impurity ions implanted occurs as the step of said implanting impurity ions is performed.” None of the cited references, singly or in combination, teaches or suggests at least this feature of the claimed invention. Accordingly, Applicants respectfully submit that claim 55 and claim 56, which depends therefrom, are allowable over the cited references.

Applicant believes the foregoing remarks place the application in condition for allowance and early, favorable action is respectfully solicited. If the Examiner deems that a telephone

conference would further the prosecution of this application, the Examiner is invited to call the undersigned attorney at the telephone number (202) 496 - 7500. All correspondence should continue to be sent to the below-listed address.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911.

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Respectfully submitted,

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